

IN THE CLAIMS:

The claims are amended as follows:

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1. (ONCE AMENDED) A biocompatible microparticle for inhalation, comprising at least one active principle and at least one layer coating this active principle, which is an external layer of said microparticle, said external layer containing at least one coating agent, wherein said microparticle has a mean diameter of between 1 μm and 30 μm and an apparent density of between 0.02 g/cm³ and 0.8 g/cm³.

2. (ONCE AMENDED) The microparticle as claimed in claim 1, having a mean diameter of between 1 μm and 15 μm , and an apparent density of between 0.05 g/cm³ and 0.4 g/cm³, and wherein the active principle/coating agent mass ratio of this particle is between 95/5 and 5/95.

3. (ONCE AMENDED) The microparticle as claimed in claim 1, obtained using a method comprising:

- suspending an active principle in a solution of at least one substantially polar coating agent in an organic solvent, wherein said active principle is insoluble in the organic solvent, said substantially polar coating agent is insoluble in a fluid in a supercritical state, and said organic solvent is soluble in a fluid in a supercritical state,

- bringing the suspension into contact with a fluid in a supercritical state, so as to desolvate in a controlled way the substantially polar coating agent and ensure its coacervation,

- substantially extracting the solvent using a fluid in a supercritical state and discharging the supercritical fluid/solvent mixture, and

- recovering the microparticles.

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4. (ONCE AMENDED) The microparticle as claimed in claim 1, obtained by a method comprising:

suspending an active principle in a supercritical fluid containing at least one coating agent dissolved therein, and then in ensuring coacervation of the particles by physicochemical modification of the environment.

5. (ONCE AMENDED) The microparticle as claimed in claim 3, wherein the coating agent is chosen from:

- biodegradable (co)polymers of α -hydroxycarboxylic acids,
- amphiphilic block polymers of a poly(lactic acid)-poly(ethylene oxide) type,
- biocompatible polymers of a poly(ethylene glycol), poly(ethylene oxide) type,
- polyanhydrides, poly(ortho esters), poly- ϵ -caprolactones, and derivatives thereof,
- poly(β -hydroxybutyrate), poly(hydroxyvalerate), and poly(β -hydroxybutyrate-hydroxyvalerate) copolymers,
- poly(malic acid),
- polyphosphazenes,
- block copolymers of a poly(ethylene oxide)-poly(propylene oxide) type,
- poly(amino acids),
- polysaccharides,
- phospholipids,
- fatty acid esters, and
- mixtures of the abovementioned compounds.

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6. (ONCE AMENDED) The microparticle as claimed in claim 4, wherein the coating agent is chosen from:

- phospholipids,
- mono-, di-, and triglycerides in which the fatty acid chains range from C4 to C22, and mixtures thereof,
- mixtures of glycerides and of esters of polyethylene glycol,
- cholesterol,
- fatty acid esters,
- biodegradable or bioerodible polymers soluble in a supercritical fluid, and
- mixtures thereof.

7. (ONCE AMENDED) The microparticle as claimed in claim 1, wherein the active principle is chosen from proteins, peptides, polysaccharides, anti-asthmatic agents, beta-estradiol hormones, testosterone, bronchodilators, cytotoxic agents, corticoids, antigens, and DNA fragments.

8. (ONCE AMENDED) The microparticle as claimed in claim 2, wherein the microparticle is an immediate-release microparticle, and wherein the active principle/coating agent mass ratio of this particle is between 95/5 and 80/20.

9. (ONCE AMENDED) A method for preparing microparticles for inhalation, comprising:

- suspending an active principle in a solution of at least one substantially polar coating agent in an organic solvent, wherein said active principle is insoluble in the organic solvent, said substantially polar coating agent is insoluble in a fluid in the supercritical state, and said organic solvent is soluble in a fluid in the supercritical state,

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- bringing the suspension into contact with a fluid in the supercritical state, so as to desolvate in a controlled way the substantially polar coating agent and ensure its coacervation,
- substantially extracting the solvent using a fluid in the supercritical state, and discharging the SC fluid/solvent mixture, and
- recovering the microparticles.

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10. (ONCE AMENDED) A method for preparing microparticles for inhalation, comprising suspending, with stirring, in a closed reactor, an active principle in a supercritical fluid containing at least one coating agent dissolved therein, and then in ensuring coacervation of the particles by physicochemical modification of the environment.

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Please add the following new claims:

--11. (NEW) The microparticle according to claim 1, obtained according to a method comprising:

- bringing together a coating agent and an active principle; and
- introducing a supercritical fluid, with stirring, in a closed reactor.

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12. (NEW) The microparticle according to claim 2, having a mean diameter of between 2 μm and 10 μm .

13. (NEW) The microparticle according to claim 7, wherein the protein or peptide is chosen from insulin, calcitonin, and analogues of luteinizing hormone-releasing hormone.

14. (NEW) The microparticle according to claim 7, wherein the polysaccharide is heparin.

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15. (NEW) The microparticle according to claim 7, wherein the anti-asthmatic agents are chosen from budesonide, beclometasone dipropionate, and beclometasone 17-monopropionate.

16. (NEW) The microparticle according to claim 7, wherein the bronchodilator is albuterol.

17. (NEW) The microparticle according to claim 5, wherein the biodegradable (co)polymers of α -hydroxycarboxylic acids are selected from homopolymers and copolymers of lactic acid and glycolic acid.

18. (NEW) The microparticle according to claim 17, wherein the biodegradable (co)polymers of α -hydroxycarboxylic acids are selected from poly-L-lactides and poly(lactic-co-glycolic acids).

19. (NEW) The microparticle according to claim 5, wherein the phospholipids are chosen from phosphatidylglycerols, diphosphatidylglycerols containing C12 to C18 fatty acid chains, phosphatidylcholines, diphosphatidylcholines containing C12 to C18 fatty acid chains, diphosphatidylethanolamines containing C12 to C18 fatty acid chains, and diphosphatidylserines containing C12 to C18 chains.

20. (NEW) The microparticle according to claim 19, wherein the diphosphatidylglycerols containing C12 to C18 fatty acid chains are chosen from dilauroylphosphatidylglycerol (DLPG), dimyristoylphosphatidylglycerol (DMPG), dipalmitoylphosphatidylglycerol (DPPG), and distearoylphosphatidylglycerol (DSPG).

21. (NEW) The microparticle according to claim 19, wherein the diphosphatidylcholines containing C12 to C18 fatty acid chains are chosen from

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dilauroylphosphatidylcholine (DLPC), dimyristoylphosphatidylcholine (DMPC), dipalmitoylphosphatidylcholine (DPPC), and distearoylphosphatidylcholine (DSPC).

22. (NEW) The microparticle according to claim 19, wherein the diphosphatidylethanolamines containing C12 to C18 fatty acid chains are chosen from dilauroylphosphatidylethanolamine (DLPE), dimyristoylphosphatidylethanolamine (DMPE), dipalmitoylphosphatidylethanolamine (DPPE), and distearoylphosphatidylethanolamine (DSPE).

23. (NEW) The microparticle according to claim 19, wherein the diphosphatidylserine containing C12 to C18 chains are chosen from dilauroylphosphatidylserine (DLPS), dimyristoylphosphatidylserine (DMPS), dipalmitoylphosphatidylserine (DPPS), and distearoylphosphatidylserine (DSPS).

24. (NEW) The microparticle according to claim 5, wherein the fatty acid esters are chosen from glycerylstearate, glyceryllaurate, cetylpalmitate, and mixtures thereof.

25. (NEW) The microparticle according to claim 6, wherein the phospholipids are chosen from phosphatidylglycerols, diphosphatidylglycerols containing C12 to C18 fatty acid chains, phosphatidylcholines, diphosphatidylcholines containing C12 to C18 fatty acid chains, diphosphatidylethanolamines containing C12 to C18 fatty acid chains, diphosphatidylserine containing C12 to C18 chains, and mixtures thereof.

26. (NEW) The microparticle according to claim 25, wherein the diphosphatidylglycerols containing C12 to C18 fatty acid chains are chosen from dilauroylphosphatidylglycerol (DLPG), dimyristoylphosphatidylglycerol (DMPG), dipalmitoylphosphatidylglycerol (DPPG), and distearoylphosphatidylglycerol (DSPG).

26. (NEW) The microparticle according to claim 25, wherein the diphosphatidylcholines containing C12 to C18 fatty acid chains are chosen from dilauroylphosphatidylcholine (DLPC), dimyristoylphosphatidylcholine (DMPC), dipalmitoylphosphatidylcholine (DPPC), and distearoylphosphatidylcholine (DSPC).

27. (NEW) The microparticle according to claim 25, wherein the diphosphatidylethanolamines containing C12 to C18 fatty acid chains are chosen from dilauroylphosphatidylethanolamine (DLPE), dimyristoylphosphatidylethanolamine (DMPE), dipalmitoylphosphatidylethanolamine (DPPE), and distearoylphosphatidylethanolamine (DSPE).

28. (NEW) The microparticle according to claim 25, wherein the diphosphatidylserine containing C12 to C18 chains are chosen from dilauroylphosphatidylserine (DLPS), dimyristoylphosphatidylserine (DMPS), dipalmitoylphosphatidylserine (DPPS), and distearoylphosphatidylserine (DSPS).

29. (NEW) The microparticle according to claim 6, wherein the fatty acid esters are chosen from glycerylstearate, glyceryllaurate, and cetylpalmitate.

30. (NEW) The microparticle according to claim 7, wherein the peptides are chosen from insulin, calcitonin, and analogues of luteinizing hormone-releasing hormone.

31. (NEW) The microparticle according to claim 7, wherein the polysaccharide is heparin.

32. (NEW) The microparticle according to claim 7, wherein the anti-asthmatic agent is chosen from budesonide, beclometasone dipropionate, and beclometasone 17-monopropionate.